APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/587,180	06/02/2000	Bernard A. Traversat	5181-49700	7222

7590   08/13/2003

Robert C Kowert
Conley Rose & Tayon PC
P O Box 398
Austin, TX   78767

EXAMINER
HO, THANG H

ART UNIT	PAPER NUMBER
2188	

DATE MAILED: 08/13/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 07-01)

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>07 January 2003</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-34</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-34</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

    If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____ .

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

    a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)   4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)   5) ☐ Notice of Informal Patent Application (PTO-152)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>4-7</u>.   6) ☐ Other: .

DETAILED ACTION

Information Disclosure Statement

1.   The information disclosure statement (IDS) filed on 08/06/2001, 08/13/2001, 09/17/2001

and 01/07/2003 have been received and considered. Please see attached PTO-1449.

Specification

2.   Claims 1-34 are presented for examination.

Claim Rejections - 35 USC § 103

3.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

4.   Claims 1-9, 11-29 and 31-34 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Swanberg et al. (USPN 5,778,443), hereinafter Swanberg in view of Bean et al. (USPN:

4,843,541), hereinafter Bean.

        As per claims 1 and 25, Swanberg teaches in figures 1 and 3 a method for

managing a virtual memory (305) in a computer system (100), the method comprising:

executing a process within the computer system (100), wherein the computer system

(100) comprises a virtual memory manager (335); the virtual memory manager storing

objects for the process executing on the computer system (100) to a store heap (40),

wherein the objects are for use during execution of the process; the process referencing a

first one of the objects stored in the store heap (40); and the virtual memory manager

(305) copying a section of the store heap (40) including the first object to an in-memory

heap (14) in response to the process referencing the first object, wherein the in-memory

heap (14) comprises copies of sections of the store heap (40) for the process, and wherein

said copying is performed when the first object referenced by the process is in the section

of the store heap (40) and not in the in-memory heap (14) when the first object is

referenced by the process (e.g. column 4, lines 2-6, column 2, lines 39-42 and column 6,

lines 66 et seq.). It is noted that Swanberg refers to the virtual memory manager (335) as

a paging mechanism. However, the paging mechanism is being considered as a virtual

memory manager since it performs the same function as the virtual memory manager of

the current invention (e.g. column 4, lines 2-11).

Swanberg does not teach the method for managing the virtual memory in a virtual

machine.

Bean teaches that the method for managing system resources including system

virtual memory in a virtual machine. Bean teaches that the system resources can be

divided into multiple logical partitions to support multiple virtual machines allowing

multiple applications and operating systems to operate concurrently efficiently within a

single computer system simplifying the development and implementation of operating

systems and their applications (e.g. abstract and column 7, lines 57 et seq.).

Accordingly, it would have been prima facie obvious for one skilled in the art at

the time the invention was made to implement the virtual memory management method

within a computer system as taught by Swanberg and modify the method to include the

management of virtual memory within a virtual machine as taught by Bean to generate

the claimed invention with a reasonable expectation of success for the reasons set forth above.

As per claims 2-3 and 26, Swanberg discloses the method in claim 1, further comprising: the process modifying the first object in the in-memory heap (14); and the virtual machine virtual memory manager (305) replacing the section of the store heap (40) with the copy of the section from the in-memory heap (14) including the first object in response to said modifying the first object in the in-memory heap (14); and removing the copy of the section from the in-memory heap (14) after said replacing the section of the store heap (40) (e.g. column 4, lines 12-30).

As per claims 4 and 27, Swanberg discloses the method in claim 1, wherein the virtual machine is executing on a device (100); wherein the device comprises a memory (14); and wherein the virtual machine is executing in the memory (14) comprised in the device (100).

As per claim 5, Swanberg discloses the method in claim 4, wherein the device (100) has insufficient execution memory to store an entire heap (40) for the process executing on the virtual machine (e.g. see column 1, lines 30-38).

As per claim 6, Swanberg discloses the method in claim 4, wherein the device (100), comprising a communication adapter (34), is a network client device (e.g. column 3, lines 24-26).

As per claims 7 and 28, Swanberg discloses the method in claim 1, wherein the process is executing in a first memory space comprised in the virtual machine; wherein the in-memory heap (14) is comprised in the first memory space; wherein a total size of

the store heap (40) is greater than available memory space in the first memory space; and wherein the store heap (40) is comprised in a second memory space (e.g. column 1, lines 24-38).

As per claims 8-9 and 29, Swanberg discloses the method in claim 1,wherein the virtual machine is executing on a device (100); and wherein the store heap (40) is comprised in a non-volatile memory device (32) coupled to the device.

As per claims 11 and 31, Swanberg discloses the method of claim 8, wherein the memory device comprising the store heap is coupled to the device (100) via the Internet through communication adapter (34) so that the virtual machine virtual memory manager (305) copying the section of the store heap (40) to the in-memory heap (14) occurs over the Internet (e.g. column 3, lines 24-26).

As per claims 13 and 33, Swanberg discloses the method in claim 1, wherein the store heap (40) is one of a plurality of store heaps (320) in a persistent store (32); wherein each of the plurality of store heaps (320) is associated with one of a plurality of processes; and wherein the process is one of the plurality of processes (e.g. see figure 6).

As per claims 14 and 34, Swanberg discloses the method of claim 1, wherein the objects comprised in the in-memory heap (14) and the store heap (40) comprise code and data for use by the process during execution within the virtual machine.

5.   Claims 10 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Swanberg et al. (USPN 5,778,443) as applied to claims 1-13, 15-29 and 31-34 above, and further in view of Sukegawa (USPN: 5,860,083).

Swanberg teaches the method in claim 8, wherein the memory device (32)

coupled to the device (100) is a non-volatile memory.

Swanberg does not teach the use of flash memory; wherein the store heap (40)

comprises a plurality of cache lines; and wherein the section of the store heap comprises

one or more of the plurality of cache lines.

Sukegawa teaches that flash memory can be used as a store heap (40) comprising

a plurality of cache lines to improve the overall system performance. Furthermore, it is

advantageous to use flash memory since it has higher access speed and power is not

required in order to retain cache data during power off thereby reducing the startup time

for operating systems and application programs and the overall power consumption,

respectively (e.g. figure 1, column 1, lines 17-61).

Accordingly, it would have been prima facie obvious for one skilled in the art at

the time the invention was made to implement the memory device using non-volatile

memory as taught by Swanberg and utilizing flash memory as taught by Sukegawa to

generate the claimed invention with a reasonable expectation of success for the reasons

set forth above.

6.   Claims 12 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Swanberg et al. (USPN 5,778,443) as applied to claims 1-13, 15-29 and 31-34 above, and further

in view of Fresko et al. (USPN: 5,966,702), hereinafter Fresko.

Swanberg teaches the method for managing a virtual memory in a virtual machine

as claimed.

Swanberg does not teach the use of a Java virtual machine (JVM) as the virtual

machine or to use of Java application as a process within the Java virtual machine.

Fresko teaches that a Java application or an applet can be used as a platform-

independent process executing on a JVM to accommodate the variety of hardware

systems used by clients (e.g. column 1, lines 29-37).

It would have been prima facie obvious for one skilled in the art at the time the

invention was made to implement the method for managing a virtual memory in a virtual

machine as taught by Swanberg and utilizing JVM and Java application as taught by

Sukegawa to generate the claimed invention with a reasonable expectation of success.

One skilled in the art would have been motivated to do so because Java programs

can run on any platform that supports Java. It is not necessary to recompile a Java

program to run on a new machine.

7.   Claims 15-24 and 25-34 encompass the same scope of invention as to that of claims 1-14

and 25-34, however the claims are drafted as apparatus format rather than method format, the

claims are therefore rejected for the same reasons as being set forth above.

Conclusion

8.   The prior art made of record and not relied upon is considered pertinent to applicant's

disclosure. See Form PTO-892.

9.   Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

Or faxed to:

After-final	(703) 746-7238
Official	(703) 746-7239
Non-Official/Draft	(703) 746-7240

Hand–delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA. Sixth Floor (Receptionist).

10.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thang H Ho whose telephone number is 703-305-1888. The examiner can normally be reached on Monday-Friday from 7:00 A.M. - 4:30 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mano Padmanabhan can be reached on 703-306-2903. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-6606 for regular communications and 703-308-9051 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-9600.

TH
August 7, 2003

Kevin L. Ellis
Primary Examiner